



Partner Reported Opportunities (PROs)  
for Reducing Methane Emissions

# Replace Gas Starters with Air

## PRO Fact Sheet No. 103

### Applicable sector(s):

Production       Processing       Transmission and Distribution

**Partners reporting this PRO:** ExxonMobil Company

**Other related PROs:** Install Electric Starters, Convert Engine Starting to Nitrogen, Install Instrument Air Systems, Reduce the Frequency of Engine Starts with Gas

Compressors/Engines	<input checked="" type="checkbox"/>
Dehydrators	<input type="checkbox"/>
Pipelines	<input type="checkbox"/>
Pneumatics/Controls	<input type="checkbox"/>
Tanks	<input type="checkbox"/>
Valves	<input type="checkbox"/>
Wells	<input type="checkbox"/>
Other	<input type="checkbox"/>

### Technology/Practice Overview

#### Description

In the natural gas industry, internal combustion engines for compressors, generators, and pumps are often started using small gas expansion turbine starter motors. High-pressure natural gas is stored in a volume tank while a compressor is running. The pressurized gas is expanded across the starter turbine, initiating startup of the engine, and then exhausted to the atmosphere.

Partners have found that replacing the natural gas with compressed air for engine starting can reduce methane, volatile organic compounds (VOCs), and hazardous air pollutants (HAPs) emissions.

#### Operating Requirements

A stationary or mobile air compressor is required for this practice.

#### Applicability

This practice is applicable for all natural gas pneumatic starter motors.

### Methane Emissions Reductions

The methane emissions savings are based 10 compressor startup attempts using factors found in *Perry's Chemical Engineers' Handbook*, Sixth Edition, (p. 24-15) of 0.5 scf of gas per HP at 250 psig stored to operate the starting motor. The EPA/GRI Study, "Methane Emissions from The Natural Gas Industry" Volume 8, reported 1,341 Mcf per year leakage from compressor starter open-ended lines. One partner reported methane savings of 500 Mcf per year for multiple applications.

### Methane Savings: 1,356 Mcf per year

#### Costs

Capital Costs (including installation)

<\$1,000     \$1,000 – \$10,000     >\$10,000

Operating and Maintenance Costs (annual)

<\$100     \$100-\$1,000     >\$1,000

#### Payback (Years)

0–1     1–3     3–10     >10

#### Benefits

Reducing methane emissions was the primary benefit of the project

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## Economic Analysis

### Basis for Costs and Savings

Reported methane emissions savings of 1,356 Mcf per year apply to one 3,000-horsepower reciprocating compressor that requires 10 startups per year. The compressor starter open-ended line is assumed to have average leakage.

### Discussion

This project can result in quick payback and the primary benefit is to save methane emissions. The capital cost is the installation of piping between an existing air compressor and the starter is assumed to be incremental to the cost of the air compressor already used for pneumatic controls. Operating cost includes the electrical power needed to compress the air. Associated benefits include reduced VOC and HAP emissions.